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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/022,969      | 12/13/2001  | Joseph F. Garvey     | RAL920000122US1     | 7203             |

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EXAMINER

CHOW, CHIH CHING

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2122

DATE MAILED: 09/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |                   |  |
|------------------------------|-----------------|-------------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s)      |  |
|                              | 10/022,969      | GARVEY, JOSEPH F. |  |
|                              | Examiner        | Art Unit          |  |
|                              | Chih-Ching Chow | 2122              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/13/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: Paragraph 0033, 5<sup>th</sup> line, source code **31** should be source code **21** (see FIG. 3). Appropriate correction is required.

### ***Claim Objections***

2. Claim 1 is objected to because of the following informalities: 3<sup>rd</sup> paragraph should end with a ';', and indentation of the paragraphs for this claim. Appropriate corrections are required.
3. Claim 6 is objected to because of the following informalities:
  - 3<sup>rd</sup> paragraph should end with a ';'. Appropriate correction is required.
  - 3<sup>rd</sup> paragraph should be changed to "in response to receiving said identifier token matching a macro identifier stored in a symbol table;".
  - Indentation of the paragraphs for this claim.Appropriate corrections are required.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1 - 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 2002/0016639, by Marjorie L. Smith et al. (hereinafter "Smith"), in view of U.S. Patent No. 6,715,141 by Bruce Hodge (hereinafter "Hodge"), further in view of U.S. 2002/0129341, by Gregory Hibdon (hereinafter "Hibdon"), and further in view of U.S. Patent No. 5, 768,564 by Kristy A. Andrews (hereinafter "Andrews").

### CLAIMS

1. A method for processing macros of varying grammatical invocation by a preprocessor, said method comprising;

- (a) receiving an identifier token from source code;
- (b) in response to said identifier token matching a macro identifier stored in a symbol table,
- (c) replacing said identifier token with a macro form token corresponding to said identifier token from said symbol table;
- (d) sending said macro form token to a glue routine;
- (e) invoking a macro invocation parser by said glue routine;
- (f) transferring tokens to said macro invocation parser via said glue routine until a completion of said macro invocation; and
- (g) sending a macro body definition of said macro to a lexer by said macro invocation parser.

### Smith / Hodge / Hibdon / Andrews

For item (a), (b) and (c), see Smith, paragraph 0242, "FIG. 93 is a flowchart representation of other particular aspects of the compiling process. The process commences at block 1181, and continues at block 1183, wherein the system **receives IHML source code** at the IHML compiler. Then, in accordance with block 1185, the system utilizes a preprocessor to look up the "macros" contained in the **source code in a macro table (matching)**. Next, in accordance with block 1187, the system utilizes the preprocessor **to transform all macros into corresponding predefined strings** as set forth in the macro table. **(replacing said identifier token)**". Smith discloses the concepts of **receiving** the token from the source code, **match** if the macro is defined in a macro symbol table and **replacing** the token with the macro form token. For items (d), (e), (f) and (g), Smith does not teach the 'transferring tokens until a completion of said macro invocation' feature. However, Hodge teaches this feature in an analogous prior art, in Hodge, paragraph 7, "In full parse phase, the interpreter **tokenizes** and parses lines of code in their **entirety**, executing the lines of code as they are parsed. The interpreter remains in full parse phase **until a script stop token is detected**. Upon detecting the script stop token, the interpreter switches its

mode back to the scan phase." The macro body definition is disclosed by Hibdon. In Hibdon's abstract, "A line of data is read from a design file containing **source code** written in a high level language. Keywords representing specific type of **macro** are generated from the read data, and parsed. If a **macro** is present, the commands representing operation to be performed by macro, are inserted into stream of keyword. The keywords are written to an output file." Also, Hibdon's figure 2, shows the embodiment of the prior art. Further in Hibdon, paragraph 35, "Initially, an HDL file 205 is read by the tokenizer module 210. Briefly, the tokenizer module 210 reads an HDL line 215 from the HDL file 205 and stores lines as necessary in a lookahead list 230. This lookahead list is used to temporarily store lines as necessary. For example, several lines may need to be stored when a single HDL statement consists of more than one line of code. The tokenizer module 210 **recursively expands HDL macros 220 and stores the expanded macros in a macro expansion list 235.** As necessary, the tokenizer module 210 reads 225 tokens first from the lookahead list 230, then from the macro expansion list 235, and finally from the HDL file 205 and passes them (***passes the expanded macros***) to the HDL parser module 240. The processing of the **tokenizer module 210** will be discussed in greater detail below with reference to figure 3." Paragraph 36, "The **HDL parser module 240** is presented with a stream of tokens from the tokenizer module 'as if' all the macros have been expanded. This allows the parsing to be separated from the problem of selective macro expansion. The parsing program therefore sees only the expanded macros. The 'as if' parsing

process is discussed in greater detail below with reference to figure 4." In Hibdon, paragraph 41, "By using a tokenizing module **in conjunction with** an 'as if' parser, the lower level complexity is separated from the parsing. The HDL parsing program is presented with a stream of tokens by the tokenizing module 'as if' all the macros have been expanded" this part of processing has the same function as the **glue routine** specified in current invention. In the meantime, the 'Macro Expansion List' is like the '**lexer**' which stores the macro body (item g). Andrews further teaches the **macro invocation** in an analogous prior art, in Andrews, paragraph 23, "A 'fragment' represents the result of an invocation of a virtual source production mechanism: source file inclusion, **macro expansion**, or macro formal parameter substitution. Each fragment is linked to the tokens that make up its invocation syntax: a macro formal parameter, a **macro invocation** (including the parameter list), or a token representing a source inclusion directive. Each fragment contains the tokens composing its expansion: a macro actual parameter, a macro body, or an included file. The tokens composing the invocation syntax are themselves contained in another fragment, which represents its context of use. For example, a macro invocation can be embedded in a macro body, or in the main program file." It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to supplement the **receiving, matching and replacing macro tokens** of Smith with the sending, expanding and storing macros further taught by Hodge, Hibdon, and Andrews, for the purpose of allowing programmers to use shorthand expressions (macros) for

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longer constructs (See Andrews, paragraph 12), and able to expand macros during parsing phase (See Hibdon, paragraph 41).

2. The method of Claim 1, wherein said receiving step is performed by a lexer.

For the feature of claim 1 see claim 1 rejection. For the rest of claim 2 features declared in the current invention done by 'lexer' has been covered in prior arts by Smith, Hodge, Hibdon, and Andrews.

3. The method of Claim 1, wherein said replacing step is performed by a lexer.

Same as claim rejection 2.

4. The method of Claim 1, wherein said sending step is performed by a lexer.

Same as claim rejection 2.

5. The method of Claim 1, wherein said transferring step further includes transferring tokens from a lexer to said macro invocation parser.

Same as claim rejection 2.

6. A computer program product residing on a computer usable medium for processing macros of varying grammatical invocation by a pre-processor, said computer program product comprising:

Same as claim 1 rejection.

(a) program code means for receiving an identifier token from source code;

(b) in response to said identifier token matching a macro identifier stored in a symbol table,

(c) program code means for replacing said identifier token with a macro form token corresponding to said identifier token from said symbol table;

(d) program code means for sending said macro form token to a glue routine;

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(e) program code means for invoking a macro invocation parser by said glue routine;

(f) program code means for transferring tokens to said macro invocation parser via said glue routine until a completion of said macro invocation; and

(g) program code means for sending a macro body definition of said macro to a lexer by said macro invocation parser.

7. The computer program product of Claim 6, wherein said program code means for receiving is a lexer.

For the feature of claim 6 see claim 6 rejection. For the rest of claim 7 features declared in the current invention done by 'lexer' has been covered in prior arts by Smith, Hodge, Hibdon, and Andrews.

8. The computer program product of Claim 6, wherein said program code means for replacing is a lexer.

Same as claim rejection 7.

9. The computer program product of Claim 6, wherein said program code means for sending is a lexer.

Same as claim rejection 7.

10. The computer program product of Claim 6, wherein said program code means for transferring further includes computer code means for transferring tokens from a lexer to said macro invocation parser.

Same as claim rejection 7.

### ***Conclusion***

The following summarizes the status of the claims:

Claim objections: claims 1, 6.

35 U.S.C. 103 rejections: claims 1-10.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Ching Chow whose telephone number is 703-305-7205. The examiner can normally be reached on 7:00am - 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 703-305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chih-Ching Chow  
Examiner  
Art Unit 2122

CC



ANTONY NGUYEN-BA  
PRIMARY EXAMINER